

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

Claims 1 - 16 (Canceled).

Claim 17 (New): A high-frequency semiconductor device comprising:

an antenna-ground plane provided above a semiconductor substrate, to be connected to a ground potential;

a patch electrode provided on said antenna-ground plane with an interlayer insulation film therebetween;

an antenna connection provided under said antenna-ground plane and connected to said patch electrode via a through-hole formed passing through said antenna-ground plane; and

a line conductor provided on said antenna-ground plane with an interlayer insulation film therebetween, said line conductor forming a high-frequency transmission line together with said antenna-ground plane,

wherein said antenna-ground plane is provided on a substantially entire surface of said semiconductor substrate.

Claim 18 (New): A high-frequency semiconductor device as set forth in claim 17, wherein said antenna connection is an antenna line of a patterned conductor.

Claim 19 (New): A high-frequency semiconductor device as set forth in claim 17, wherein said antenna connection is an active region formed in said semiconductor substrate.

Claim 20 (New): A high-frequency semiconductor device as set forth in claim 17, wherein said interlayer insulation film is composed of a resin insulating material.

Claim 21 (New): A high-frequency semiconductor device as set forth in claim 20, wherein said resin insulating material is a polyimide or benzocyclobutene.

Claim 22 (New): A high-frequency semiconductor device as set forth in claim 17, wherein said patch electrode has a rectangular shape or a circular shape.

Claim 23 (New): A high-frequency semiconductor device as set forth in claim 17, wherein each of said patch electrode and antenna-ground plane is formed of a high conductive material.

Claim 24 (New): A high-frequency semiconductor device as set forth in claim 23, wherein said high conductive material is gold or a super conductor.

Claim 25 (Newly added): A high-frequency semiconductor device comprising: an antenna-ground plane provided above a semiconductor substrate, to be connected to a ground potential;

a patch electrode provided on said antenna-ground plane with an interlayer insulation film therebetween;

an antenna connection provided under said antenna-ground plane and connected to said patch electrode via a through-hole formed passing through said antenna-ground plane; and

a line conductor provided on said antenna-ground plane with an interlayer insulation film therebetween, said line conductor forming a high-frequency transmission line together with said antenna-ground plane,

wherein said antenna-ground plane is formed to extend to up to a region in which said antenna-ground plane has no longer any effect for antenna functions, and said line conductor is provided on said antenna-ground plane in said region.

Claim 26 (New): A high-frequency semiconductor device as set forth in claim 25, further comprising:

a ground plate provided between said antenna-ground plane and said semiconductor substrate and under said antenna connection, said ground plate being formed to extend over a substantially entire surface of said semiconductor substrate and to be connected to a ground potential; and

another line conductor provided on said ground plate with an interlayer insulation film therebetween, said another line conductor forming a high-frequency transmission line together with said ground plate.

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Claim 27 (Newly added): A high-frequency semiconductor device as set forth in claim 25, further comprising a passive device provided under said antenna-ground plane, said passive device being any one of line conductors, capacitors, inductors or resistors.

Claim 28 (New): A high-frequency semiconductor device as set forth in claim 25, wherein said antenna connection is an antenna line of a patterned conductor.

Claim 29 (New): A high-frequency semiconductor device as set forth in claim 25, wherein said interlayer insulation film is composed of a resin insulating material.

Claim 30 (New): A high-frequency semiconductor device as set forth in claim 29, wherein said resin insulating material is a polyimide or benzocyclobutene.

Claim 31 (New): A high-frequency semiconductor device as set forth in claim 25, wherein said patch electrode has a rectangular shape or a circular shape.

Claim 32 (New): A high-frequency semiconductor device comprising:
an antenna-ground plane provided above a semiconductor substrate, to be connected to a ground potential;
a patch electrode provided on said antenna-ground plane with an interlayer insulation film therebetween;
an antenna connection provided under said antenna-ground plane and connected to said patch electrode via a through-hole formed passing through said antenna-ground plane;

a ground plate provided between said antenna-ground plane and said semiconductor substrate and under said antenna connection, said ground plate being formed to extend over a substantially entire surface of said semiconductor substrate and to be connected to a ground potential; and

a line conductor provided on said ground plate with an interlayer insulation film therebetween, said line conductor forming a high-frequency transmission line together with said ground plate,

wherein said antenna-ground plane and said line conductor are formed together on a common surface of said interlayer insulation film intervening between said line conductor and said ground plate.

Claim 33 (New): A high frequency semiconductor device as set forth in claim 32, further comprising a passive device provided under said antenna-ground plane, said passive device being any one of line conductors, capacitors, inductors or resistors.

Claim 34 (New): A high-frequency semiconductor device as set forth in claim 32, wherein said antenna connection is an antenna line of a patterned conductor.

Claim 35 (New): A high-frequency semiconductor device as set forth in claim 32, wherein said interlayer insulation film is composed of a resin insulating material.

Claim 36 (New): A high-frequency semiconductor device as set forth in claim 35, wherein said resin insulation material is a polyimide or benzocyclobutene.

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Claim 37 (New): A high-frequency semiconductor device as set forth in claim 32, wherein said patch electrode has a rectangular shape or a circular shape.